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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|-----------------------|---------------------|------------------|
| 10/764,802 | 01/26/2004 | Michael E. Herbstreit | BING-1-1050 | 9769 |
| 25315 | 7590 | 01/17/2006 | EXAMINER | |
| BLACK LOWE & GRAHAM, PLLC 701 FIFTH AVENUE SUITE 4800 SEATTLE, WA 98104 | | | CHERRY, STEPHEN J | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2863 | |

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/764,802 | Applicant(s) HERBSTREIT ET AL. | |
| | Examiner Stephen J. Cherry | Art Unit 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-7,13,16,17,21,24 and 25 is/are rejected.
- 7) ☒ Claim(s) 2,3,8-12,14,15,18-20,22,23 and 26-28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Objections

Claim 5 is objected to because of the following informalities:

1. In claim 5, the meaning of the phrase, "being providing" is unclear.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, 7, 13, 16, 21, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,258,422 to Dougherty et al.

Claim 1 recites, as disclosed by Dougherty:

1. A method of simulating a volume of liquid within a tank during motion, comprising: receiving tank geometry information ('422, col. 8, line 64, "shape and volume"); receiving sensor configuration information ('422, col. 8, line 64, "probe locations"); receiving tank motion information ('422, col. 8, line 64, "attitude"); computing one or more fuel-plane-to-sensor intersections for at least one tank position based on the tank motion information ('422, col. 8, line 67, "length"); computing one or more wetted

volumes, each wetted volume being computed at a fuel-plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and computing a fuel quantity at every fuel-plane-to-sensor intersection based on a sum of the one or more wetted volumes ('422, col. 8, line 66, "total wetted sensing length").

Claim 4 recites, as disclosed by Dougherty:

4. The method of Claim 1 wherein receiving tank geometry information includes receiving height-to-volume values ('422, col. 8, line 66).

Claim 5 recites, as disclosed by Dougherty:

5. The method of Claim 1 wherein receiving an input file of height-to-volume values from a storage device, the height-to-volume values being obtained by incrementally slicing through a computer aided design model of the tank at a given attitude, each slice being providing an incremental volume of the tank ('422, col. 8, line 66).

Claim 7 recites, as disclosed by Dougherty:

The method of Claim 1, wherein computing one or more fuel-plane-to-sensor intersections includes mathematically transforming sensor coordinates from the sensor configuration information ('422, col. 8, line 62, probe locations transformed into data suitable for use by computer).

Claim 13 recites, as disclosed by Dougherty:

13. A computer-readable medium encoded with a computer program product for simulating a volume of liquid within a tank during motion, comprising:

a first computer program portion adapted to receive tank geometry information ('422, col. 8, line 64, "shape and volume"); a second computer program portion adapted receive sensor configuration information ('422, col. 8, line 64, "probe locations"); a third computer program portion adapted to receive tank motion information ('422, col. 8, line 64, "attitude"); a fourth computer program portion adapted to compute one or more fuel-plane-to-sensor intersection for at least one tank position based on the tank motion information ('422, col. 8, line 67, "length"); a fifth computer program portion adapted to compute one or more wetted volumes, each wetted volume being computed at a wetted volume at every fuel plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and a sixth computer program portion adapted to compute a fuel quantity at every fuel plane-to-sensor intersection based on a sum of the one or more wetted volumes ('422, col. 8, line 66, "total wetted sensing length").

Claim 16 recites, as disclosed by Dougherty:

16. The computer readable medium of Claim 13, wherein the first computer program portion is adapted to receive height-to-volume values ('422, col. 8, line 66).

Claim 18 recites, as disclosed by Dougherty:

18. The computer program product of Claim 13, further comprising a seventh computer program portion adapted to determine a non-linearity condition of a fuel gauging system based on one or more of the computed errors ('349, col. 3, line 6, faulty probe).

Claim 21 recites, as disclosed by Dougherty:

21. A system for simulating a volume of liquid within a tank during motion, comprising: a control component ('422, col. 9, line 2, "computer"); an input/output device coupled to receive input data ('422, col. 9, line 2, part of "computer"); and a processor arranged to analyze the input data ('422, col. 9, line 2, "computer"), the processor including: a first portion adapted to receive tank geometry information ('422, col. 8, line 64, "shape and volume"); a program portion adapted receive sensor configuration information ('422, col. 8, line 64, "probe locations"); a third portion adapted to receive tank motion information ('422, col. 8, line 64, "attitude"); a fourth portion adapted to compute one or more fuel-plane-to-sensor intersection for at least one tank position based on the tank motion information ('422, col. 8, line 67, "length"); a fifth portion adapted to compute one or more wetted volumes, each wetted volume being computed at a fuel plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and a sixth portion adapted to compute a fuel quantity at every fuel plane-to-sensor

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intersection based on a sum of the wetted volumes ('422, col. 8, line 66, "total wetted sensing length").

Claim 24 recites, as disclosed by Dougherty:

24. The system of Claim 21, wherein the first portion is adapted to receive height-to-volume values ('422, col. 8, line 66).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,258,422 to Dougherty et al in view of U.S. Patent 5,350,405 to Silvan.

The claims recite, as disclosed by Dougherty:

receiving tank geometry information ('422, col. 8, line 64, "shape and volume"); receiving sensor configuration information ('422, col. 8, line 64, "probe locations"); receiving tank motion information ('422, col. 8, line 64, "attitude"); computing one or more fuel-plane-to-sensor intersections for at least one tank position based on the tank motion information ('422, col. 8,

line 67, "length"); computing one or more wetted volumes, each wetted volume being computed at a fuel-plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and computing a fuel quantity at every fuel-plane-to-sensor intersection based on a sum of the one or more wetted volumes ('422, col. 8, line 66, "total wetted sensing length");

a first computer program portion adapted to receive tank geometry information ('422, col. 8, line 64, "shape and volume"); a second computer program portion adapted receive sensor configuration information ('422, col. 8, line 64, "probe locations"); a third computer program portion adapted to receive tank motion information ('422, col. 8, line 64, "attitude"); a fourth computer program portion adapted to compute one or more fuel-plane-to-sensor intersection for at least one tank position based on the tank motion information ('422, col. 8, line 67, "length"); a fifth computer program portion adapted to compute one or more wetted volumes, each wetted volume being computed at a wetted volume at every fuel plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and a sixth computer program portion adapted to compute a fuel quantity at every fuel plane-to-sensor intersection based on a sum of the one or more wetted volumes ('422, col. 8, line 66, "total wetted sensing length").

a control component ('422, col. 9, line 2, "computer"); an input/output device coupled to receive input data ('422, col. 9, line 2, part of "computer"); and a processor arranged to analyze the input data ('422, col. 9, line 2, "computer"), the processor including: a first portion adapted to receive tank geometry information ('422, col. 8, line 64, "shape and volume"); a program portion adapted receive sensor configuration information ('422, col. 8, line 64, "probe locations"); a third portion adapted to receive tank motion information ('422, col. 8, line 64, "attitude"); a fourth portion adapted to compute one or more fuel-plane-to-sensor intersection for at least one tank position based on the tank motion information ('422, col. 8, line 67, "length"); a fifth portion adapted to compute one or more wetted volumes, each wetted volume being computed at a fuel plane-to-sensor intersection for each sensor location based on the sensor configuration information ('422, col. 8, line 67, "volume"); and a sixth portion adapted to compute a fuel quantity at every fuel plane-to-sensor intersection based on a sum of the wetted volumes ('422, col. 8, line 66, "total wetted sensing length")

Although Dougherty disclosed the data described in claims 6, 17, and 25, Dougherty does not disclose interpolating that data.

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The claims further recite interpolating data, as disclosed by Silvian ('405, col. 5, line 36).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the interpolation of data of Silvian with the invention of Dougherty to improve precision of results ('405, col. 5, line 45).

Allowable Subject Matter

Claims 2-3, 8-12, 14-15, 18-20, 22-23, and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2-3, 14-15, and 22-23 recite comparing an error with at least one previously computed error. This feature in combination with the remaining claimed structure avoids the prior art of record.

Claims 8-12, 18-20, and 26-28 recite determining a non-linearity condition based on one or more computed errors. This feature in combination with the remaining claimed structure avoids the prior art of record.

Response to Arguments

Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Cherry whose telephone number is (571) 272-2272. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SJC


MICHAEL NGHIEM
PRIMARY EXAMINER